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- f. Fore femora not enlarged.
    - g. Mouth cone acute.
        - h. Tube short; eyes prolonged on ventral side of head; a pair of long bristles on vertex at inner angles of eyes; intermediate antennal segments obliquely truncate at both base and apex.
          Omnatothrips Hood '15.
        - hh. Tube, eyes and cephalic bristles not as above; antennal segments normal. ......*Liothrips* Uzel.
    - gg. Mouth cone blunt; individuals very large.
      Polyphemothrips Hood and Williams.
- ff. Fore femora greatly enlarged.
  Horistothrips Morgan '13.

55. *Frankliella tritici* (Fitch). THE GRAIN THRIPS.

A single specimen of the typical species as distinct from the common varieties was swept from Eupatorium ageratoides in November 1918. The antennal segments 2 are typically symmetrical and the measurements agree closely with those given for the species. The spcimen is, however, almost colorless except for the eyes, and the bristles in front of the ocelli are very small. This is the first specimen of the typical species the writer has seen from Florida.

MODERN BEEKEEPING*

By FRANK STIRLING

One of the most fascinating pursuits and one that has shown a remarkable degree of expansion during the past few years is beekeeping. As in the case of other lines of endeavor, the tendency is more towards specialization. Authorities, such as Henry Alley, G. M. Doolittle and Frank C. Pellett, have found that, in order to develop beekeeping up to its present state of perfection, careful selection of the Queen Bee was necessary. The queen bee is the foundation of the community, or colony, because she is eventually the mother of all the bees in the hive. It is therefore necessary that she be vigorous, a rigorous egg layer, and like race horses, well bred.

There are many species of bees. During spring and summer one can see many different kinds among blossoms and flowers, but most of these are of very little economic importance; their only value lies in carrying pollen from flower to flower, and for this reason they are sometimes called the "Marriage Priests" of the flowers. Higher up in the scale one finds the bumble bees, which not only are useful in pollenizing, but store up very small quantities of honey.

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*Read before the Florida Entomological Society on Dec. 30, 1918.

While the number of species of these less important bees is considerable, only those commonly known as honey bees (of the genus *Apis)* are the ones of real importance as honey producers.

Of this genus, the great bee of southern Asia *(Apis dorsata)* has been the subject of considerable interest. This giant bee builds a very large single comb out in the open, generally suspended from the branch of a forest tree. On account of its fierceness, efforts to domesticate it have not met with success.

In Mr. Frank C. Pellett's book, "Practical Queen Rearing", mention is made of a number of other species of bees, of which the most important is the *Apis florea,* a very gentle little bee, much smaller than the common honey bee, and which builds a delicate little comb around a twig.

But of all species, the common honey bee *(Aphis mellifica)* is the only one that has been found of real value as a honey producer. Of this species a number of varieties occur, namely, the Italians, Blacks, Carniolans, etc.

While the Italians are generally accepted as the most valuable bees and are by far the most popular in the United States, some very good results have been obtained by the black bee here in Florida. The Italian has been tried out under all kinds of conditions and has proved the most satisfactory, as it is more gentle than the blacks and is more resistant to certain diseases.

Honey bees are not native to America. The wild bees often seen in Florida are the descendants of those imported. According to the *American Bee Journal,* the first honey bees were imported into Florida by the Spaniards previous to 1763, for they were first noticed in West Florida during that year, and it is quite probable they were brought to this State first, as they were not noticed in any other state until 1780, at which time they were observed in Kentucky; in New York in 1793; and west of the Mississippi river in 1797. The bees introduced by the Spaniards were evidently what is commonly known as the black, or German

(Continued on page 106)

But common names are convenient for local usage, because they are in plain English, easier to spell and pronounce, and absolutely necessary to the economic entomologist who needs to discuss insect problems with many people.

MODERN BEEKEEPING

(Continued from page 103)

bee, and it has been generally supposed that our first bees came from Germany, but Pellett, who is accepted as authority, states that they very probably came from Spain. The native black bees of Great Britain, France, Germany and Spain are said to differ but little.

While the production of honey has for centuries been considered a profitable undertaking, it was not brought to its present state of perfection until such men as A. I. Root, L. L. Langstroth, and a few others, by means of the invention of modern methods, gave it the prominence it now attains. The 8 and 10 frame regulation hive which was invented by Langstroth has been almost universally adopted by progressive beekeepers, thereby making it easier to handle the bees.

Many states have beekeepers' associations, and at their annual meetings the most up to date methods for handling bees are discussed, and such men as E. F. Phillips, Kenneth Hawkins and others from the Department of Agriculture, as well as authorities like C. P. Dadant frequently attend. At the Iowa Experiment Station short courses in beekeeping are annually given, and at the Universities of Missouri and Texas departments of entomology have been offering courses in beekeeping for the regular University students; women as well as men select these courses, and upon completing their University course have pushed beekeeping in their respective communities.

Had it not been for this industry, the whole world would have suffered much more from the lack of sweets than it did during the past months, when war conditions made the amount of sugar available inadequate for the needs of mankind.

Increase in the cost of honey, due to the big export demand created by the war, makes it safe to predict that the coming year will see the greatest effort ever made in furthering beekeeping. During the last half of this year, honey to the value of perhaps $2,000,000 was exported—about 10 times the valuation for any year previous to the beginning of the war—indicating that honey has ceased to be a luxury in the minds of the Allied Peoples.

Also, the home demand for honey has increased. Figures are not available, however, as much of the honey of this country never reaches the larger centers of trade.

The amount of sweet produced by bees is really enormous. Honey is produced in this country, in ordinary years, in excess of two hundred and fifty million pounds. Those plants and flowers from which bees gather nectar are legion, and are scattered throughout the length and breadth of the land. The white-clover belt is the most important honey-producing region, because it furnishes not only the leading commercial honey but also more than one-half of the honey crop of the entire country. This belt extends from Maine to Virginia and westward to the great plains. From white clover alone is secured about one tenth of the Nation's crop of honey. This kind is almost colorless and has a delicate and delicious flavor.

According to the United States Department of Agriculture, alfalfa honey comes second in importance commercially, while sweet clover is third in line of importance. About 4 per cent of the Nation's honey comes from flowers of the cotton plant, 3½ per cent from the bass-wood, 3 per cent from the tulip poplar tree and buckwheat, and 2 per cent from the goldenrod.

California leads all other states in the production of honey. In fact, she produces about 20 per cent of the entire Nation's crop. This is because of the presence of great quantities of mountain sages, together with the fact that the beekeepers of that state have gone into the business in a business-like manner, using modern equipment.

Florida has, until recent years, been backward in her beekeeping industry. There have been, however, some few pioneer beekeepers in this State who have made more than a success of it. The late Mr. O. O. Poppleton was considered one of the foremost veteran beekeepers in the State, and on the East Coast, where he operated, he harvested immense crops of honey from the orange, palmetto and mangrove. Mr. W. S. Hart of Hawks Park, also a Florida beekeeper of prominence, has for years operated an apiary with profitable results in the hammocks along the East Coast. Dr. Edwin G. Baldwin, Professor of Latin at the Stetson University, has for many years made a business of beekeeping, and while it is more a hobby with him, yet it has turned out to be a very profitable one. In fact, he has made himself very prominent as a queen breeder, and his queens, in large numbers, have been sent throughout the North. Mr. H. L. Christopher is now operating two large apiaries in the groves of the Atwood Grapefruit Ranch at Manatee, where the bees were intended primarily for the fertilization of the orange and grapefruit bloom. Mr. A. I. Root, the celebrated founder of the largest bee supply establishment in the world, and one of the foremost authorities on beekeeping, has for years operated apiaries in different sections of the State. Mr. Root spends his winters in Manatee County, and although he is 79 years old, he can still be seen plugging away at his winter home near Bradentown.

Even on the western side of Lake Okeechobee, Mr. C. C. Cook produces some of the most wonderful crops of honey ever heard of (mostly from gallberry).

While the main harvests of honey were formerly produced in the western portion of Florida, in the bottom lands of the Apalachicola and Choclahatchee Rivers, and in the southern portion of Walton County, the opportunities for this industry have in recent years been found present in practically all sections of the State.

The mild winters in Florida tend to make beekeeping more profitable than in the northern and western states. The low cost of operation is largely due to the fact that the bees have a chance to gather a little honey during almost every month. Then there is the large number of honey-producing plants; most desirable of which are the orange, palmetto, tupelo, titi, mangrove, partridge pea, goldenrod, gallberry, Spanish clover, and cotton. (Cotton produces about 32 per cent of all the honey made in the Southern States.)

It is not even necessary to have a farm on which to keep bees; they seem to do just about as well in cities and towns (where the number of colonies is limited) as they do in the country. I happen to know of one gentleman in Jacksonville who has four or five hives on top of a five-story office building, and I have heard of similar instances in Tampa.

Right here within the city limits of Gainesville, which section is not by any means considered well adapted for bee culture, there are to my knowledge 9 men who keep bees; these 9 men have a total of 48 colonies and there are undoubtedly others. As a rule, these gentlemen have had very good harvests of honey during the past year. One of them, who has but 2 colonies, made 172 pounds of surplus honey and comb. My own bees (I have six hives in my back yard) made an average of 70 pounds surplus per colony this past season; and one of them, a ten-frame hive, made a little over 100 pounds.

Bees, if permitted to swarm naturally, will increase about double each year, although some will swarm more than that, so when a beginner starts out with one or two colonies, it is not many years before he has quite a large sized apiary. The cost of operation, with a few colonies, is very little, and the time required for their care is of no real importance.

It is advisable that those who anticipate going into the business of keeping bees should start out with not more than one or two colonies, learning all they can about it while their colonies are increasing. In order to secure the best information on the subject, it is advisable to subscribe to some one of the bee journals published in this country and to secure some text book, such as "A. B. C. and X. Y. Z. of Bee Culture". Bulletins on beekeeping can also be obtained free of charge from the Department of Agriculture, Washington, D. C. Failures have been made by some who started in on too large a scale, not having the needed experience required in handling large numbers of hives. The subject is one that should be thoroly studied, and one finds that the deeper he gets into it the more interesting it becomes. As stated before, the first question is that of selecting good stock; then it is necessary that the bees should be properly housed in regulation hives, using comb foundation for the purpose of keeping the honey comb straight. Regardless of the opinion expressed by some, the old fashioned hive, or "gum", should never be considered, as it has been conclusively proven unprofitable. The entrances to the hives should be so adjusted as to assist the bees in protecting themselves from their enemies, and care should be taken to so place the hives that they will have the proper amount of shade and ventilation.

The up-to-date beekeeper is not only an operator of his apiary, but a co-operator with his bees, and it seems that the bees soon become educated by the partnership as well as the beekeeper. By this co-operation and co-education of bees and beekeeper, together with an increased interest in the business and with sensible up to date handling, the result will be a development of honey production now scarcely dreamed of.

STRATEGUS WANTED—Am making a special study of this genus, of the Scarabeidae, and should be very glad to receive Florida specimens, especially of the rarer specie. Will exchange or pay cash. Address W. Knaus, McPherson, Kansas.

WANTED—Diurnal Lepidoptera of Florida in exchange for desirable western species. Over 3000 butterflies on hand for exchanges. Dr. John A. Comstock, Southwest Museum, Los Angeles, Calif.

WANTED—To buy or exchange for northern species, southern Chrysophidae (Lace-winged-flies). All stages desired, especially material for biological studies. Will determine specimens. Dr. Roger C. Smith, U. S. Ent. Lab., Charlottesville, Va.

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